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Patent Application Transmittal

(only for new nonprovisional applications under 37 C.F.R. 1.53(b))

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Date: July 28, 2000Attorney Docket No.: 450100-02622JCE82 U.S. PTO
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Sir:

With reference to the filing in the United States Patent and Trademark Office
of an application for patent in the name(s) of:

Tomoko OYABU, Mitsuru NAGASAKA, Aki KOYABU, Tomoyuki HANAI

entitled:

PROGRAM GUIDE INFORMATION PROVIDING DEVICE, PROGRAM DEVICE INFORMATION
PROVIDING SYSTEM, INFORMATION RECEIVING DEVICE, REMOTE OPERATING SYSTEM, AND
METHOD THEREOF

The following are enclosed:

- ☒ Specification (39 pages)
☒ 9 Sheet(s) of Drawings
☒ 16 Claim(s) (including 8 independent claim(s))
☐ This application contains a multiple dependent claim

- ☒ Our check for \$ 1080.00, calculated on the basis of the claims as
amended by any enclosed preliminary amendment as follows:

Basic Fee, \$690.00 (\$345.00)	\$ 690.00
Number of Claims in excess of 20 at \$18.00 (\$9.00) each:	-0-
Number of Independent Claims in excess of 3 at \$78.00 (\$39.00) each: 5	390.00
Multiple Dependent Claim Fee at \$260.00 (\$130.00)	-0-
Total Filing Fee	\$ 1080.00
Assignment Recording Fee \$40.00	-0-

- ☒ Oath or Declaration and Power of Attorney

☒ New ☐ signed ☒ unsigned
☐ Copy from a prior application (37 C.F.R. 1.63(d))

- ☒ Certified copy of each of the following application(s) to substantiate
the claim(s) for priority made in the Declaration:

<u>Application No.</u>	<u>Filed</u>	<u>In</u>
11-217773	30 July 1999	Japan

Please charge any additional fees required for the filing of this
application or credit any overpayment to Deposit Account No. 50-0320.

Respectfully submitted,

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Dear Sir:

Enclosed are papers constituting the above patent application which is being filed under 37 C.F.R. 1.53 without a signed Declaration. Please accord a filing date and a serial number to such application and inform the undersigned thereof so that a signed Declaration and the surcharge required by 37 C.F.R. 1.16(e) may be duly filed.

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Respectfully,



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Enclosures

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Date of Deposit July 28, 2000

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PATENT
450100-02622

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION FOR LETTERS PATENT

TITLE: PROGRAM GUIDE INFORMATION PROVIDING
DEVICE, PROGRAM DEVICE INFORMATION
PROVIDING SYSTEM, INFORMATION RECEIVING
DEVICE, REMOTE OPERATING SYSTEM, AND
METHOD THEREOF

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PROGRAM GUIDE INFORMATION PROVIDING DEVICE, PROGRAM GUIDE
INFORMATION PROVIDING SYSTEM, INFORMATION RECEIVING DEVICE,
REMOTE OPERATING SYSTEM, AND METHOD THEREOF

BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention relates to a program guide information providing device, a program guide information providing system, an information receiving device, a remote operating system, and the method for these, and is suitably applied to a receiver which receives broadcast waves transmitted from a broadcast station for example and which displays images according to the broadcast waves on a monitor.

2. Description of the Related Art

Conventionally, with broadcasting stations which perform broadcasting services using analog ground waves, usable frequency bands are appropriated beforehand, and the broadcasting stations transmit their own program data using the appropriated frequency bands. Receivers situated in the homes of viewers (hereafter referred to as IRDs (Integrated Receiver Decoders)) select program data from a desired broadcasting station from the multiple sets of program data sent from various broadcasting stations according to selecting operations made by viewers, and decode and display

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Further, remote commanders generally using infrared rays are employed as means for performing remote operation of the IRD, but the remote commander can only be used within a certain range from the IRD, so there is the need for the

SUMMARY OF THE INVENTION

The present invention made to solve such problems stores beforehand in program guide information storing means program guide information indicating the contents of programs to be supplied by predetermined program supplying means;

correlates preference information indicating the preferences of user using the communication terminal device with identification information appropriated to the communication terminal device, and stores the preference information beforehand in preference information storing

means;

reads from the preference information storing means the preference information corresponding to the identification information transmitted from the communication terminal device;

searches programs matching the preferences of the user from the program guide information based on the read preference information;

generates searched program guide information comprising the searched programs; and

transmits the searched program guide information to the communication terminal device;

thereby providing the user with program guide information matching the preferences of the user, regardless of the location of the user using the communication terminal device.

BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 is a block diagram illustrating the analog ground wave broadcasting system according to the present invention;

Fig. 2 is a block diagram illustrating an embodiment of an information receiving device according to the present invention;

Fig. 3 is a table illustrating the contents of EPG

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data;

Fig. 4 is a block diagram illustrating the configuration of a cellular telephone with remote-control functions;

Fig. 5 is a block diagram illustrating the configuration of a cellular telephone;

Fig. 6 is a flowchart illustrating the program reservation setting process procedures in the case of obtaining EPG data from an IRD;

Fig. 7 is another flowchart illustrating the program reservation setting process procedures in the case of obtaining EPG data from an IRD;

Fig. 8 is a flowchart illustrating the program reservation setting process procedures in the case of obtaining EPG data from an EPG server; and

Fig. 9 is another flowchart illustrating the program reservation setting process procedures in the case of obtaining EPG data from an EPG server.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

An embodiment of the present invention will now be described with reference to the drawings.

(1) Configuration of the analog ground wave broadcasting system

In Fig. 1, reference numeral 1 illustrates the overall

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configuration of the analog ground wave broadcasting system comprising a remote operating system, with the transmitting devices 2A through 2N serving as program supplying means installed at each broadcasting station transmitting picture signals and audio signals for the programs via the transmitting antennas 3A through 3N. The relay device 4 relays the broadcast waves transmitted from each of the transmitting devices 2A through 2N, and distributes these to the receivers 5 situated in the homes of viewers (hereafter referred to as IRDs (Integrated Receiver Decoders)).

The IRD 5 receives the broadcasting waves distributed from the multiple broadcasting stations with a receiving antenna 6, selects program data of the broadcasting station specified from the received program data of the multiple broadcasting stations according to selection operations made by the viewer (user) with a cellular telephone with remote commander functions (hereafter referred to as "cellular telephone with remote-control functions") MS1, demodulates the program data of the selected broadcasting station, and outputs and displays this on a monitor 8 serving as the display means.

(2) Configuration of IRD

As shown in Fig. 2, the IRD 5 receives command signals S1 superimposed on infrared rays and transmitted from the cellular telephone with remote-control functions MS1 (Fig.

1) with the infrared transmitting/receiving unit 10, the command signals S1 are converted into electric signals to generate command signals S2, following which this is sent to the CPU (Central Processing Unit) 11.

The CPU 11 reads out control programs stored in ROM (Read Only Memory) 12 as necessary, and transfers the read control programs to RAM (Random Access Memory) 13 for implementation. The CPU 11 then reads out and executes the control programs from the RAM 13, thereby controlling the circuits of the IRD 5.

The CPU 11 analyzes the command signals S2 sent from the infrared transmitting/receiving unit 10, and in the event that the results of the analysis lead to judgement that the viewer has performed station selection with the cellular telephone with remote-control functions MS1 (Fig. 1), a channel selection signal S3 according to the station selection operation is generated, and sent to the tuner 15.

The tuner 15 extracts broadcast waves of the channel (broadcast station) according to the channel selection signal S3 from the broadcast waves received by the receiving antenna 6 (Fig. 1), demodulates the broadcast waves of the extracted channel so as to generate audio signals S5 and picture signals S6, and sends the audio signals S5 to the audio processing unit 16 while sending the picture signals S6 to the picture processing unit 17.

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The audio processing unit 16 subjects the audio signals S5 to analog/digital conversion, then performs compression encoding with an encoding method based on the MPEG (Moving Pictures Experts Group) specifications, and sends the audio encoded data S7 obtained thereby to the audio decoder 19 via the multiplex/dividing unit 18. The picture processing unit 17 subjects the picture signals S6 to analog/digital conversion, then performs compression encoding by an encoding method based on MPEG specifications, and sends the picture encoded data S8 thus obtained to the picture decoder 20 via the multiplex/dividing unit 18.

The audio decoder 19 expands and decodes the audio encoded data S7, and sends the audio data S9 obtained thereby to the digital/analog (D/A) conversion circuit 21. The D/A conversion circuit 21 performs digital/analog conversion of the audio data S9, thereby restoring the audio signals S10 before input to the audio processing unit 16, which is output to the monitor 8 (Fig. 1).

The picture decoder 20 expands and decodes the picture encoded data S8, and sends the picture data S11 obtained thereby to the RGB encoder 22. The RGB encoder 22 performs conversion of the picture data S11 into NTSC (National Television System Committee) luminance signals and chromatic signals and performs digital/analog conversion thereof, thereby generating picture signals S12, which are sent to

the monitor 8 (Fig. 1).

Hence, the picture of the program which the viewer has selected is displayed on the display screen 8A of the monitor 8 (Fig. 1), while the audio of the program which the viewer has selected is output from the speaker of the monitor 8.

Now, with regard to the analog ground wave broadcasting system 1, program description data called electronic program guide information (referred to as EPG (Electronic Program Guide) data) is periodically distributed from a specified broadcasting station, in order to notify viewers of the programs to be provided from each broadcasting station.

This EPG data is generated for each program, and as shown in Fig. 3, is made up of information such as individual program ID, broadcasting station No. of transmitting station, broadcasting station name of transmitting station, start time of program, duration (or ending time) of program, program title, program sub-title supplementing the program title, program description, and program genre, and serves as material for the viewers to make judgement. Note that the program ID, broadcasting station No., and program genre are represented in code data, the broadcasting station name, program title, program sub-title, and program description, are represented in text data,

and the start time and duration are represented in time data.

The transmitting device 2 installed at a specific broadcasting station superimposes EPG data for one week for example upon the VBI (Vertical Blanking Interval) of the picture signals, and this is periodically transmitted daily using time frames such as late night or early morning.

In this case, the tuner 15 of the IRD 5 extracts the broadcast waves of the channel upon which the EPG data is superimposed, from the broadcast waves received by the receiving antenna 6 (Fig. 1), and the broadcast waves of the extracted channel are demodulated, thereby generating picture signals S15 which are sent to the VBI slicer 25.

The VBI slicer 25 extracts the EPG data S16 from the picture signals S15, and transfers the EPG data S16 to the RAM 13 serving as program guide information storing means via the bus BUS, where it is stored. Thus, the IRD 5 updates the EPG data S16 stored in the RAM 13 daily, and always stores the newest EPG data S16 in the RAM 13.

In this state, in the event that the viewer performs an operation with the cellular telephone with remote-control functions MS1 (Fig. 1) for displaying the EPG screen, the cellular telephone with remote-control functions MS1 transmits a command signal S1 for displaying the EPG screen to the infrared transmitting/receiving unit 10. The infrared transmitting/receiving unit 10 converts this

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The CPU 11, upon detecting the fact that a command signal S2 has been supplied, generates EPG screen data S17 by subjecting the EPG data S16 to graphic processing on the RAM 13, based on dictionary data such as characters and symbols stored in the ROM 12, and then sends the EPG screen data S17 to the graphic engine 26 via the bus BUS.

Now, in the event that the viewer performs an operation with the cellular telephone with remote-control functions MS1 (Fig. 1) for recording the picture and audio of a program, the cellular telephone with remote-control functions MS1 transmits a command signal S1 for performing a recording action to the infrared transmitting/receiving unit 10. The infrared transmitting/receiving unit 10 converts this command signal S1 into a command signal S2 formed of an electric signal, which is sent to the CPU 11.

The CPU 11, upon detecting the fact that a command signal S2 has been supplied, transfers the recorded title list data S21 to the RAM 13, generates recorded title list screen data S22 by subjecting the recorded title list data S21 to graphic processing on the RAM 13, based on dictionary data such as characters and symbols stored in the ROM 12, and then sends the recorded title list screen data S22 to the graphic engine 26 via the bus BUS.

The graphic engine 26 generates recorded title list image signals S23 by converting the recorded title list screen data S22 into NTSC luminance signals and chromatic signals, and performs digital/analog conversion thereof, which are sent to the RGB encoder 22. The RGB encoder 22 mixes the image signals S12 and recorded title list image signals S23 and outputs these to the monitor 8 (Fig. 1), thereby displaying a recorded title list screen according to

the recorded title list image signals S23 on the display screen 8A of the monitor 8.

Now, in the event that the viewer performs an operation with the cellular telephone with remote-control functions MS1 (Fig. 1) for reproducing the picture and audio of a desired program while viewing the recorded title list screen displayed on the display screen 8A of the monitor 8, the cellular telephone with remote-control functions MS1 transmits a command signal S1 for performing a reproducing action to the infrared transmitting/receiving unit 10. The infrared transmitting/receiving unit 10 converts this command signal S1 into a command signal S2 formed of an electric signal, which is sent to the CPU 11.

The CPU 11, upon detecting the fact that a command signal S2 has been supplied, controls the actions of the circuits via the bus BUS such that the picture and audio of the program specified with the cellular telephone with remote-control functions MS1 (Fig. 1) are reproduced. That is, the recording media unit 30 reads out the multiplex data S25 of the program specified from the multiplex data of the multiple programs recorded in the built-in recording medium (not shown), and sends this to the multiplex/dividing unit 18.

The multiplex/dividing unit 18 divides the multiplex data S25 into audio encoded data S26 and picture encoded

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Each cellular telephone MS has an individual telephone No. appropriated thereto as unique identification information, and in the event that the telephone No. of the cellular telephones MS are input via the operating input unit 37, the CPU 11 of the IRD 5 stores and registers the telephone No. of the input cellular telephones MS in the flash memory 31.

Now, with the present embodiment, the IRD 5 stores and records broadcast program preference information of each user (hereafter referred to as "program preference information") beforehand in the flash memory 31 serving as preference information storing means. That is to say, in the event that a user operates the user registration screen key of the operating input unit 37 provided to the IRD 5,

Now, with the present embodiment, the IRD 5 stores and records broadcast program preference information of each user (hereafter referred to as "program preference information") beforehand in the flash memory 31 serving as preference information storing means. That is to say, in the event that a user operates the user registration screen key of the operating input unit 37 provided to the IRD 5,

the CPU 11 of the IRD 5 generates user registration screen data on the RAM 13 based on the control program being implemented in the RAM 13, and displays a predetermined user registration screen based on the user registration screen data thus generated on the display screen 8A of the monitor 8.

Then, as the user following the guidance of the user registration screen to sequentially inputs program preference information made up of information such as channels and genres and the like preferred by each user, via the operating input unit 37, the CPU 11 stores and registers in the flash memory 31 the program preference information of each user in a manner correlated with the telephone No. of the cellular telephone MS which each user uses.

(4) Configuration of the cellular telephone system

The cellular telephone with remote-control functions MS1 is positioned at a predetermined position in the home of the viewer, so that infrared exchange can be made with the IRD 5. Fig. 4 illustrates the configuration of the cellular telephone with remote-control functions MS1. The cellular telephone with remote-control functions MS1 inputs audio signals of the user input from the microphone 40 into a transmitting/receiving circuit unit 41. The transmitting/receiving circuit unit 41 sequentially executes processing on these audio signals such as digitizing

On the other hand, at the time of receiving, the cellular telephone with remote-control functions MS1 inputs reception signals received by the antenna 42 to the transmitting/receiving circuit unit 41. The transmitting/receiving circuit unit 41 sequentially executes processing on these received signals such as expansion decoding processing, demodulating processing, and analog processing, so as to restore the audio signals, which are output from the speaker 43. Thus, the user can hear the voice of the other party via the speaker 43.

The CPU 44 reads the control programs stored in the memory 45 as necessary, and controls the actions of the circuits by executing the control programs which have been read out. Also, the CPU 44 controls the actions of the circuits based on operating information input via the operating input unit 46, and displays predetermined information on the display 47, according to necessity.

The infrared transmitting/receiving unit 48 superimposes command signals S1 being supplied from the CPU 44 onto infrared rays which are transmitted to the IRD 5, and also receives transmission signals being transmitted from the IRD 5 superimposed on infrared rays, and converts

the received reception signals into electric signals which are sent to the CPU 44.

As shown in Fig. 1, the cellular telephone with remote-control functions MS1 exists within a cell C1 formed by dividing an area to which communication service by the cellular telephone system is provided into desired sizes, such that the cellular telephone with remote-control functions MS1 performs wireless communication with a base station BS1 installed within the cell C1. The base station BS1 is connected to a mobile communication control station 50 of a higher order, and the mobile communication control station 50 stores in home memory 51 the position information indicating that the cellular telephone with remote-control functions MS1 exists within the cell C1, based on the signals being sent from the base station BS1.

Now, let us say that in this state, the user takes his/her own cellular telephone MS2 out of the home, and moves into a cell C2 where a base station BS2, for example, is. In this case, the cellular telephone MS2 performs wireless communication with the base station BS2 within the cell C2, and the mobile communication control station 50 stores in home memory 51 the position information indicating that the cellular telephone MS2 exists within the cell C2, based on the signals being sent from the base station BS2.

Fig. 5 illustrates the configuration of the cellular

On the other hand, at the time of receiving, the cellular telephone MS2 inputs reception signals received by the antenna 57 to the transmitting/receiving circuit unit 56. The transmitting/receiving circuit unit 56 sequentially executes processing on these received signals such as expansion decoding processing, demodulating processing, and analog processing, so as to restore the audio signals, which are output from the speaker 58. Thus, the user can hear the voice of the other party via the speaker 58.

The CPU 59 reads the control programs stored in the memory 60 as necessary, and controls the actions of the circuits by executing the control programs which have been read out. Also, the CPU 59 controls the actions of the circuits based on operating information input via the operating input unit 61, and displays predetermined information on the display 62, according to necessity. The audio synthesizing unit 63 generates audio signals based on

the instructions of the CPU 59, which are output from the speaker 58, thereby communicating the desired information to the user.

(5) Program reservation settings processing procedures

As shown in Fig. 1, in the event that the cellular telephone MS2 exists in the cell C2, the user operating the call key of the operating input unit 61 and inputting the telephone No. of the cellular telephone with remote-control functions MS1 causes the CPU 59 of the cellular telephone MS2 to execute the program reservation settings processing procedures RT1 for obtaining EPG data from the IRD 5, as shown in Fig. 6 and Fig. 7.

That is, once the CPU 59 of the cellular telephone MS2 enters into the program reservation settings processing procedures RT1 for obtaining EPG data from the IRD 5, as in Fig. 6 and Fig. 7, the flow proceeds to step SP1, the action of the transmitting/receiving circuit unit 56 is controlled so as to call the cellular telephone with remote-control functions MS1. In the subsequent step SP2, judgement is made regarding whether or not the cellular telephone with remote-control functions MS1 and the cellular telephone MS2 have been connected by a line, and the processing steps SP1 and SP2 are sequentially repeated until positive results are obtained.

In the event that positive results are obtained for

step SP2, this means that the cellular telephone with remote-control functions MS1 and the cellular telephone MS2 have been connected by a line, so in this case the CPU 59 of the cellular telephone MS2 proceeds to step SP3, and in the event that the reservation key of the operating input unit 61 is pressed, this is detected and the flow proceeds to step SP4, where the reservation command data corresponding to the pressed reservation key are read out from the memory 60, and the read reservation command data is transmitted to the cellular telephone with remote-control functions MS1 via the transmitting/receiving circuit unit 56 and antenna 57 in sequence.

Then, in the subsequent step SP5, the cellular telephone with remote-control functions MS1 receives the reservation command data sent from the cellular telephone MS2, and transmits the received reservation command data with the telephone No. of the cellular telephone MS2 attached thereto as command signal S1 to the IRD 5, by superimposing on infrared rays. In the subsequent step SP6, the CPU 11 of the IRD 5 analyses the command signal S1 received by the infrared transmitting/receiving unit 10, and judgement is made whether or not the telephone No. of the cellular telephone MS2 indicated by the analysis results thereof is stored in the flash memory 31.

In the event that positive results are obtained in

In the subsequent step SP8, the cellular telephone with remote-control functions MS1 receives the EPG data being sent from the IRD 5, and transmits the received EPG data to the cellular telephone MS2. Then, in step SP9, the cellular telephone MS2 receives the EPG data sent from the cellular telephone with remote-control functions MS1 with the antenna 57, and sends this to the CPU 59 via the antenna 57 and transmitting/receiving circuit unit 56 in sequence. The CPU 59 of the cellular telephone MS2 stores this EPG data in the memory 60, and displays the EPG screen corresponding to the EPG data on the display 62 serving as the notifying means.

In this state, in the event that the user presses the audio guide key of the operating input unit 61, the CPU 59 reads out the EPG data from the memory 60, and supplies this to the audio synthesizing unit 63. The audio synthesizing unit 63 generates audio signals based on this EPG data, and outputs the audio signals from the speaker 58 serving as the notifying means, thereby audibly notifying the user of the information corresponding to the EPG screen.

Then, in step SP10, in the event that the desired program is selected from the multiple programs displayed on the EPG screen, the CPU 59 of the cellular telephone MS2 proceeds to the subsequent step SP11, and transmits the date and time of broadcast of the selected program, the channel thereof, program title, and so forth, as reservation program data, to the cellular telephone with remote-control functions MS1.

In the subsequent step SP12, the cellular telephone with remote-control functions MS1 receives the reservation program data sent from the cellular telephone MS2, and transmits the received reservation program data to the IRD 5. In step SP13, the IRD 5 receives this reservation program data with the infrared transmitting/receiving unit 10, and following storing the received reservation program data to the flash memory 31 and performing the reservation settings, transmits reservation completed data indicating that the

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reservation settings have been completed from the infrared transmitting/receiving unit 10 to the cellular telephone with remote-control functions MS1.

In step SP14, the cellular telephone with remote-control functions MS1 receives the reservation completed data being sent from the IRD 5, and transmits the received reservation completed data to the cellular telephone MS2. In the subsequent step SP15, the cellular telephone MS2 receives the reservation completed data with the antenna 57, and sends this to the CPU 59 via the antenna 57 and transmitting/receiving circuit unit 56 in sequence. The CPU 59 of the cellular telephone MS2 generates message information corresponding to the reservation completed data, and displays this on the display 62, thereby notifying the user that reservation has been completed.

In this state, in the event that the user presses the audio guide key of the operating input unit 61, the cellular telephone MS2 makes audio output from the speaker 58 that the reservation has been completed. Then, the CPU 59 of the cellular telephone MS2 completes the processing procedures in step SP16.

On the other hand, in the event that negative results are obtained in step SP6, this means that the telephone No. of the cellular telephone MS2 is not stored in the flash memory 31 of the IRD 5, so in this case the CPU 11 of the

IRD 5 proceeds to step SP17, generates reservation unavailable data indicating that reservation setting is not available in this case, which is transmitted from the infrared transmitting/receiving unit 10 to the cellular telephone with remote-control functions MS1.

In the subsequent step SP18, the cellular telephone with remote-control functions MS1 receives the reservation unavailable data being sent from the IRD 5, and transmits the received reservation unavailable data to the cellular telephone MS2. In the subsequent step SP19, the cellular telephone MS2 receives the reservation unavailable data sent from the cellular telephone with remote-control functions MS1 with the antenna 57, and sends this to the CPU 59 via the antenna 57 and transmitting/receiving circuit unit 56 in sequence. The CPU 59 generates message information corresponding to this reservation unavailable data and displays it on the display 62, thereby notifying the user that reservation is not available.

In this state, in the event that the user presses the audio guide key of the operating input unit 61, the cellular telephone MS2 audibly outputs from the speaker 58 that reservation is not available. Then, the CPU 59 of the cellular telephone MS2 completes the processing procedures in step SP16.

Subsequently, the CPU 11 of the IRD 5 acts as

Then, once the user performs operations to display the recorded title list screen on the cellular telephone MS2, the CPU 11 of the IRD 5 reads the recording title list data S21 from the flash memory 31, transmits the read recording title list data S21 to the cellular telephone MS2 via the cellular telephone with remote-control functions MS1, and displays the recording title list screen corresponding to the recording title list data S21 on the display 62 of the cellular telephone MS2.

In the above-described configuration, the IRD 5 correlates the program preference information of each user with the telephone No. of the cellular telephone MS used by each user, and stores each of these in the flash memory 31.

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user on the display 62 of the cellular telephone MS2 out of the programs that have been recorded on the recording medium unit 30 as a recorded title list screen facilitates ease of managing the programs, even in the event that the number of programs recorded on the recording medium unit 30 increases. At this time, the user can only display his/her recorded title list screen on the display 62, so erroneous operations wherein the user erases programs recorded by other users can be prevented.

According to the above configuration, program preference information for each of multiple users is registered beforehand to the IRD 5 for each telephone No. of the cellular telephones MS used by each user, and in the event that a given user of the multiple users performs a program list display operation with his/her own cellular telephone MS, a list of programs matching the preferences of the user using the cellular telephone MS is generated based on the program preference information corresponding to the telephone No. transmitted from the cellular telephone MS via the cellular telephone with remote-control functions MS1, and this is transmitted to the cellular telephone MS, thereby allowing a program list matching the preferences of the user to be provided to the user, regardless of where the user using the cellular telephone MS is located.

(7) Other embodiments

Now, in the above-described embodiment, an arrangement wherein the cellular telephone MS2 obtains EPG data from the IRD 5 was described, but the present invention is by no means restricted to such; rather, an arrangement may be made wherein EPG data is obtained from other various types of information providing apparatus such as an EPG server 71 connected to the mobile communication control station 50 via the Internet 70, as shown in Fig. 1. In the event of obtaining EPG data from the EPG server 71, there is no need for the IRD 5 to store EPG data S16 in the RAM 13 of the IRD 5, so the memory capacity of the RAM 13 can be conserved.

In this case, the user registers his/her own program preference information in a manner correlated with the user ID serving as identification information, to the database unit (not shown) of the EPG server 71 beforehand.

Then, in the event that the user of the cellular telephone MS2 operates the call key of the operating input unit 61 and inputs the telephone No. of the access point of the ISP, the CPU 59 of the cellular telephone MS2 executes a program reservation setting processing procedure RT2 for obtaining EPG data from the EPG server 71, as shown in Figs. 8 and 9.

That is, as shown in Figs. 8 and 9, once the flow enters the program reservation setting processing procedure RT2 for obtaining EPG data from the EPG server 71, the CPU

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59 of the cellular telephone MS2 proceeds to step SP20, calls the access point of the ISP by controlling the action of the transmitting/receiving circuit unit 56, and in the subsequent step SP21 accesses the EPG server 71.

Then, in the event that the user inputs the user ID via the operating input unit 61, the CPU 59 of the cellular telephone MS2 in step SP22 transmits the input user ID to the EPG server 71 via the transmitting/receiving circuit unit 56 and antenna 57 in sequence. In step SP23, the EPG server 71 receives the user ID sent from the cellular telephone MS2, and judges whether or not the received user ID is registered in the database unit.

In the event that positive results are obtained for step SP23, this means that the user ID of the user using the cellular telephone MS2 has been registered in the database unit, and at this time the EPG server 71 proceeds to the subsequent step SP24, reads the program preference information corresponding to the user ID from the database unit, generates EPG data matching the preferences of the user based on the read program preference information, and transmits this to the cellular telephone MS2.

In step SP25, the cellular telephone MS2 receives the EPG data sent from the EPG server 71 with the antenna 57, and sends this to the CPU 59 via the antenna 57 and transmitting/receiving circuit unit 56 in sequence. The CPU

In this state, in the event that the user presses the audio guide key of the operating input unit 61, the CPU 59 reads out the EPG data from the memory 60, and supplies this to the audio synthesizing unit 63. The audio synthesizing unit 63 generates audio signals based on this EPG data, and outputs the audio signals from the speaker 58, thereby audibly notifying the user of the information corresponding to the EPG screen.

Then, in step SP26, in the event that the desired program is selected from the multiple programs displayed on the EPG screen, the CPU 59 of the cellular telephone MS2 proceeds to the subsequent step SP27, and transmits the date and time of broadcast of the selected program, the channel thereof, program title, and so forth, as reservation program data, to the cellular telephone with remote-control functions MS1.

In the subsequent step SP28, the cellular telephone with remote-control functions MS1 receives the reservation program data sent from the cellular telephone MS2, and transmits the received reservation program data to the IRD 5. In step SP29, the IRD 5 receives this reservation program data with the infrared transmitting/receiving unit 10, and

In step SP30, the cellular telephone with remote-control functions MS1 receives the reservation completed data being sent from the IRD 5, and transmits the received reservation completed data to the cellular telephone MS2. In the subsequent step SP31, the cellular telephone MS2 receives the reservation completed data with the antenna 57, and sends this to the CPU 59 via the antenna 57 and transmitting/receiving circuit unit 56 in sequence. The CPU 59 generates message information corresponding to the reservation completed data, and displays this on the display 62, thereby notifying the user that reservation has been completed.

On the other hand, in the event that negative results

In step SP34, the cellular telephone MS2 receives the unregistered data being sent from the EPG server 71 with the antenna 57, and sends the unregistered data to the CPU 59 via the antenna 57 and transmitting/receiving circuit unit 56 in sequence. The CPU 59 generates message information corresponding to this unregistered data and displays it on the display 62, thereby notifying the user that the input user ID is unregistered.

Also, though the above embodiments have been described as a case wherein setting operation of the registration recording is performed from the cellular telephone MS2, the present invention is not restricted to such; rather, various setting operations such as power on/off, switching channels,

Also, though the above embodiments have been described as a case wherein setting operation of the registration recording is performed from the cellular telephone MS2, the present invention is not restricted to such; rather, various setting operations such as power on/off, switching channels,

replay, etc., may be performed.

Also, though the above embodiments have been described with reference to a case wherein the EPG screen is displayed on the display 62 of a cellular telephone MS2, the present invention is not restricted to such; rather, the display of the EPG screen may be made on the display screen 8A of a monitor 8.

Also, though the above embodiments have been described with reference to a case wherein the IRD 5 is operated from a cellular telephone MS2 via a cellular telephone with remote-control functions MS1, the present invention is not restricted to such; rather, an arrangement may be made wherein the IRD 5 is operated with other various remote commanders connected to predetermined communicating means such as a fixed telephone connected to a public telephone line for example, as long as the arrangement has functions for exchanging with infrared.

Also, though the above embodiments have been described with reference to a case wherein the cellular telephone with remote-control functions MS1 and the IRD 5 are connected with infrared, the present invention is not restricted to such; rather, an arrangement may be made wherein the connection is a line connection using Ethernet, for example.

Also, though the above embodiments have been described with reference to a case wherein the telephone No. of the

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cellular telephone MS2 is transmitted each time command signals S1 are transmitted from the cellular telephone with remote-control functions MS1 to the IRD 5, the present invention is not restricted to such; rather, an arrangement may be made wherein the telephone No. of the cellular telephone MS2 is transmitted at the time of turning on the power of the IRD 5 so as to register this telephone No. in the IRD 5, and cancel the registration at the point of turning off the power or completing registration settings.

Also, though the above embodiments have been described with reference to a case wherein EPG data indicating the contents of programs provided from broadcasting stations is provided from an IRD 5 to a cellular telephone MS2, the present invention is not restricted to such; rather, program guide information indicating the contents of other various programs may be provided from a program guide information providing device to a cellular telephone MS.

Also, though the above embodiments have been described with reference to a case wherein the cellular telephone MS2 is used as a communication terminal device, the present invention is not restricted to such; rather, other various communication terminal devices may be widely applied.

Further, though the above embodiments according to the present invention have been described with reference to an arrangement wherein information received by an IRD 5 of a

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As described above, the present invention stores beforehand in program guide information storing means program guide information indicating the contents of programs to be supplied by predetermined program supplying means;

reads from the preference information storing means the preference information corresponding to the identification information transmitted from the communication terminal device;

generates searched program guide information comprising the searched programs; and

transmits the searched program guide information to the communication terminal device;

thereby allowing the user to be provided with program guide information matching the preferences of the user, regardless of the location of the user using the communication terminal device.

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WHAT IS CLAIMED IS:

1. A program guide information providing device connected to a communication terminal device via predetermined communication means; said program guide information providing device comprising:

program guide information storing means for storing beforehand program guide information indicating the contents of programs to be supplied by predetermined program supplying means;

preference information storing means for correlating preference information indicating the preferences of user using said communication terminal device with identification information appropriated to said communication terminal device, and storing said preference information beforehand;

searching means for

reading from said preference information storing means said preference information corresponding to said identification information transmitted from said communication terminal device,

searching programs matching the preferences of said user from said program guide information based on said read preference information, and

generating searched program guide information comprising said searched programs; and

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Figure 1 displays 15 small plots arranged in a grid, showing the distribution of the number of non-zero elements in the product of two sparse matrices. The plots are organized into four rows, with the first row containing 4 plots and the subsequent three rows containing 3 plots each. Each plot has a horizontal axis labeled 'Number of non-zero elements' and a vertical axis labeled 'Frequency'. The plots show that as the number of non-zero elements increases, the distribution becomes more concentrated around the diagonal.

Figure 1 displays 15 small plots arranged in a grid, showing the distribution of the number of non-zero elements in the product of two sparse matrices. The plots are organized into four rows, with the first row containing 4 plots and the subsequent three rows containing 3 plots each. Each plot has a horizontal axis labeled 'Number of non-zero elements' and a vertical axis labeled 'Frequency'. The plots show that as the number of non-zero elements increases, the distribution becomes more concentrated around the diagonal.

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Figure 1 consists of 15 small plots arranged in a grid. Each plot shows the relationship between the number of subjects (n) on the x-axis and the number of trials (m) on the y-axis. The plots are labeled with different values of α (0.05, 0.1, 0.2, 0.5, 1.0, 2.0, 5.0, 10.0, 20.0, 50.0, 100.0, 200.0, 500.0, 1000.0). The plots show that as α increases, the required number of trials (m) decreases for a given number of subjects (n).

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receiving means for receiving said
identification information transmitted from said
communication terminal device;

searching means for

reading from said preference information
storing means said preference information corresponding to
said received identification information,

searching programs matching the preferences of said user from said program guide information based on said read preference information, and

generating searched program guide
information comprising said searched programs; and

transmitting means for transmitting said
searched program guide information to said communication
terminal device;

and wherein said communication terminal device comprises:

transmitting means for transmitting to said
guide information providing device said program
identification information appropriated to said
communication terminal device;

receiving means for receiving said searched
program guide information transmitted from said program
guide information providing device; and

notifying means for notifying the user of said

received searched program guide information.

4. A program guide information providing system according to Claim 3, said program guide information providing device further comprising receiving means for receiving programs supplied from said program supplying means.

5. An information receiving device connected to a communication terminal device by predetermined communication means, said information receiving device comprising:

program guide information storing means for storing beforehand program guide information indicating the contents of programs to be supplied by predetermined program supplying means;

preference information storing means for correlating preference information indicating the preferences of user using said communication terminal device with identification information appropriated to said communication terminal device, and storing said preference information beforehand;

receiving means for receiving said identification information transmitted from a remote commander connected to said communication means;

searching means for

reading from said preference information storing

searching programs matching the preferences of said user from said program guide information based on said read preference information, and

transmitting means for transmitting said searched
program guide information to said remote commander; and

6. An information receiving device according to Claim 5, further comprising recording control means for recording to recording means programs specified by said communication terminal device from a plurality of programs supplied from said program supplying means.

7. A remote operating system wherein a communication terminal device and an information receiving device are connected via predetermined communication means;

program guide information storing means for storing beforehand program guide information indicating the contents of programs to be supplied by predetermined program supplying means;

receiving means for receiving said
identification information transmitted from a remote
commander connected to said communication means;

reading from said preference information
storing means said preference information corresponding to
said received identification information,

generating searched program guide
information comprising said searched programs;

transmitting means for transmitting said
searched program guide information to said remote commander;

a remote commander having first transmitting / receiving means for directly exchanging information between said receiving means and said transmitting means, and second transmitting / receiving means for exchanging information via said communication terminal device and said communicating means;

transmitting means for transmitting to said remote commander said identification information appropriated to said communication terminal device;

notifying means for notifying the user of said received searched program guide information.

8. A remote operating system according to Claim 7, wherein said information receiving device further comprises recording control means for recording to recording means programs specified by said communication terminal device from a plurality of programs supplied from said program supplying means.

9. A program guide information providing method for a program guide information providing device connected to a communication terminal device via predetermined communication means, said method comprising the following steps:

storing beforehand in program guide information storing means program guide information indicating the contents of programs to be supplied by predetermined program supplying means;

correlating preference information indicating the preferences of user using said communication terminal device with identification information appropriated to said communication terminal device, and storing said preference information beforehand in storing means;

reading from said preference information storing means said preference information corresponding to said identification information transmitted from said communication terminal device;

searching programs matching the preferences of said user from said program guide information based on said read preference information;

generating searched program guide information comprising said searched programs; and

transmitting said searched program guide information to said communication terminal device.

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11. A program guide information providing method for a program guide information providing system comprising a communication terminal device and a program guide information providing device connected by predetermined communication means, said method comprising the following steps:

correlating preference information indicating the preferences of user using said communication terminal device with identification information appropriated to said communication terminal device, and storing said preference information beforehand in preference information storing means of said program guide information providing device;

transmitting said identification information from said
communication terminal device to said program guide

information providing device;

receiving said identification information transmitted from said communication terminal device with said program guide information providing device;

reading from said preference information storing means said preference information corresponding to said received identification information,

searching programs matching the preferences of said user from said program guide information based on said read preference information, and

generating searched program guide information comprising said searched programs;

transmitting said searched program guide information to said communication terminal device from said program guide information providing device;

receiving said searched program guide information transmitted from said program guide information providing device with said communication terminal device; and

notifying the user of said received searched program guide information via notifying means.

12. A program guide information providing method for a program guide information providing system according to Claim 11, wherein said information providing device receives programs supplied from said program supplying means.

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storing beforehand program guide information indicating the contents of programs to be supplied by predetermined program supplying means to program guide information storing means of said information receiving device;

receiving said identification information transmitted from said communication terminal device with a remote commander connected to said communication means;

receiving said identification information transmitted from said remote commander with said information receiving device;

searching programs matching the preferences of said user from said program guide information based on said read preference information;

transmitting said searched program guide information from said information receiving device to said remote commander;

transmitting said received searched program guide information from said remote commander to said communication terminal device.

14. A program guide information providing method for an information receiving device according to Claim 13, wherein said information receiving device records to recording means programs specified by said communication terminal device from a plurality of programs supplied from said program supplying means.

15. A remote operating method for a remote operating system wherein a communication terminal device and an information receiving device are connected via predetermined communication means, said method comprising the following steps:

storing beforehand program guide information indicating the contents of programs to be supplied by predetermined program supplying means to program guide information storing means of said information receiving device;

correlating preference information indicating the preferences of user using said communication terminal device with identification information appropriated to said communication terminal device, and storing said preference information beforehand in preference information storing means of said information receiving device;

transmitting said identification information from said communication terminal device to a remote commander connected to said communication means;

receiving said identification information transmitted from said communication terminal device with said remote commander;

transmitting said received identification information from said remote commander to said information receiving device;

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notifying the user of said received searched program
guide information via notifying means.

16. A remote operating method for a remote operating system according to Claim 15, wherein said information receiving device further records to recording means programs specified by said communication terminal device from a plurality of programs supplied from said program supplying means.

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A program guide information providing device is arranged so that reference information corresponding to identification information transmitted from a communication terminal device is read from preference information storage, programs matching the preferences of the user are searched from the program guide information based on the read preference information, searched program guide information is generated from the searched programs, and the searched program guide information is transmitted to the communication terminal device, thereby allowing the user to be provided with program guide information matching the preferences of the user, regardless of the location of the user using the communication terminal device.

A program guide information providing device is arranged so that reference information corresponding to identification information transmitted from a communication terminal device is read from preference information storage, programs matching the preferences of the user are searched from the program guide information based on the read preference information, searched program guide information is generated from the searched programs, and the searched program guide information is transmitted to the communication terminal device, thereby allowing the user to be provided with program guide information matching the preferences of the user, regardless of the location of the user using the communication terminal device.

FIG. 1

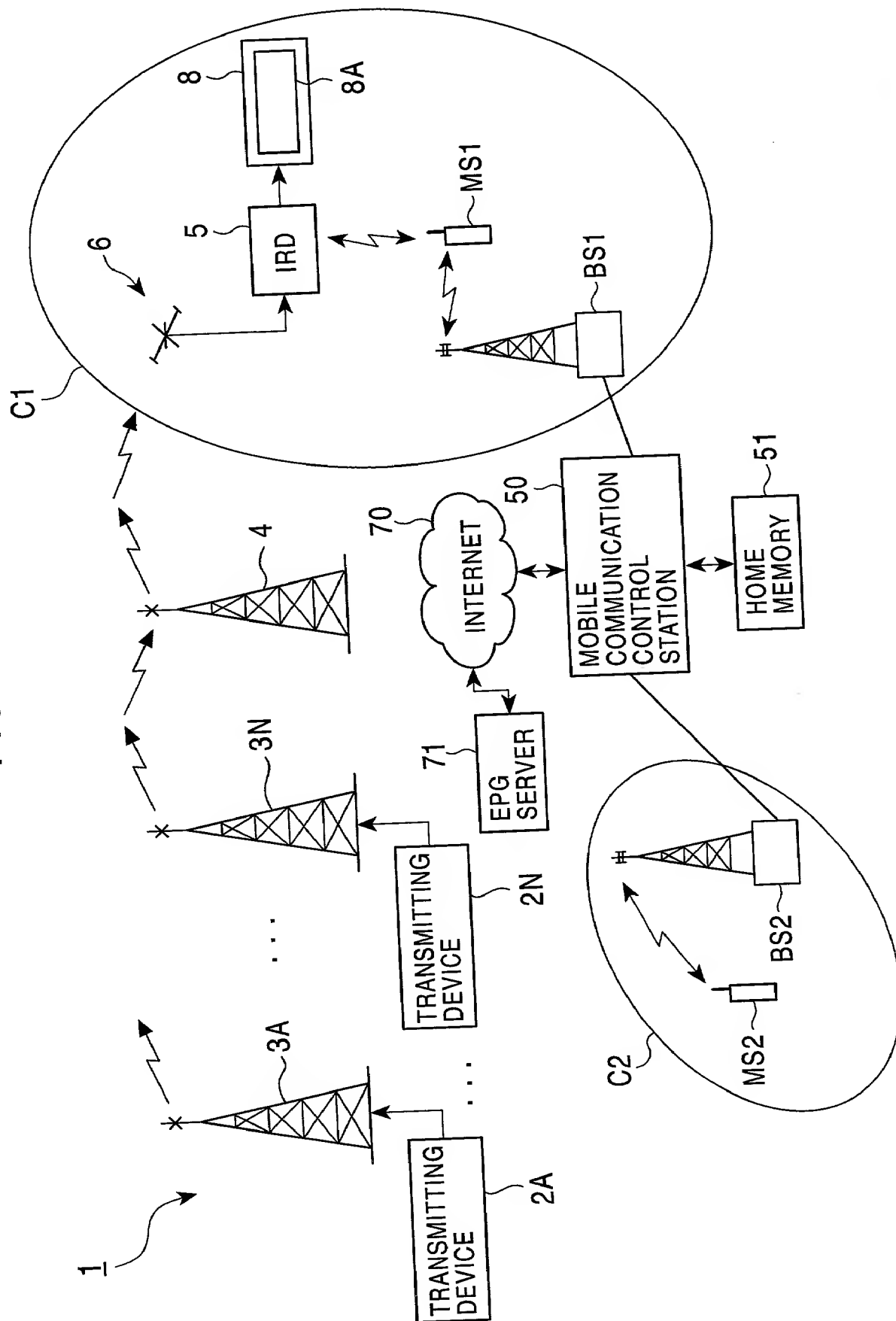


FIG. 2

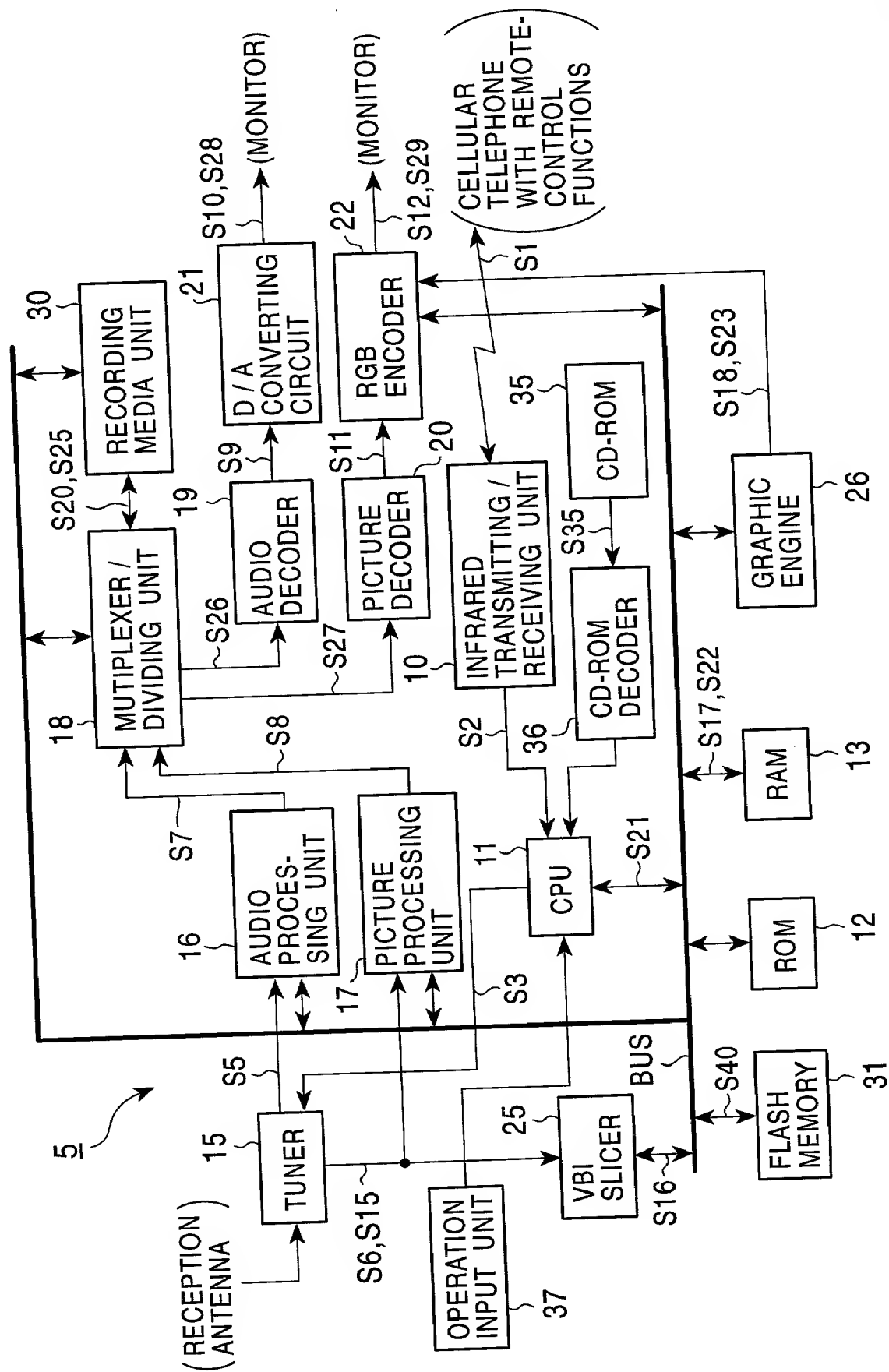


FIG. 3

PROGRAM ID	PROGRAM ID DATA (CODE)
BROADCASTING STATION NO.	CHANNEL DATA (CODE)
BROADCASTING STATION NAME	TEXT DATA
START TIME	TIME DATA
DURATION (OR ENDING TIME)	TIME DATA
PROGRAM TITLE	TEXT DATA
PROGRAM SUB-TITLE	TEXT DATA
PROGRAM DESCRIPTION	TEXT DATA
GENRE	GENRE DATA (CODE)

FIG. 4

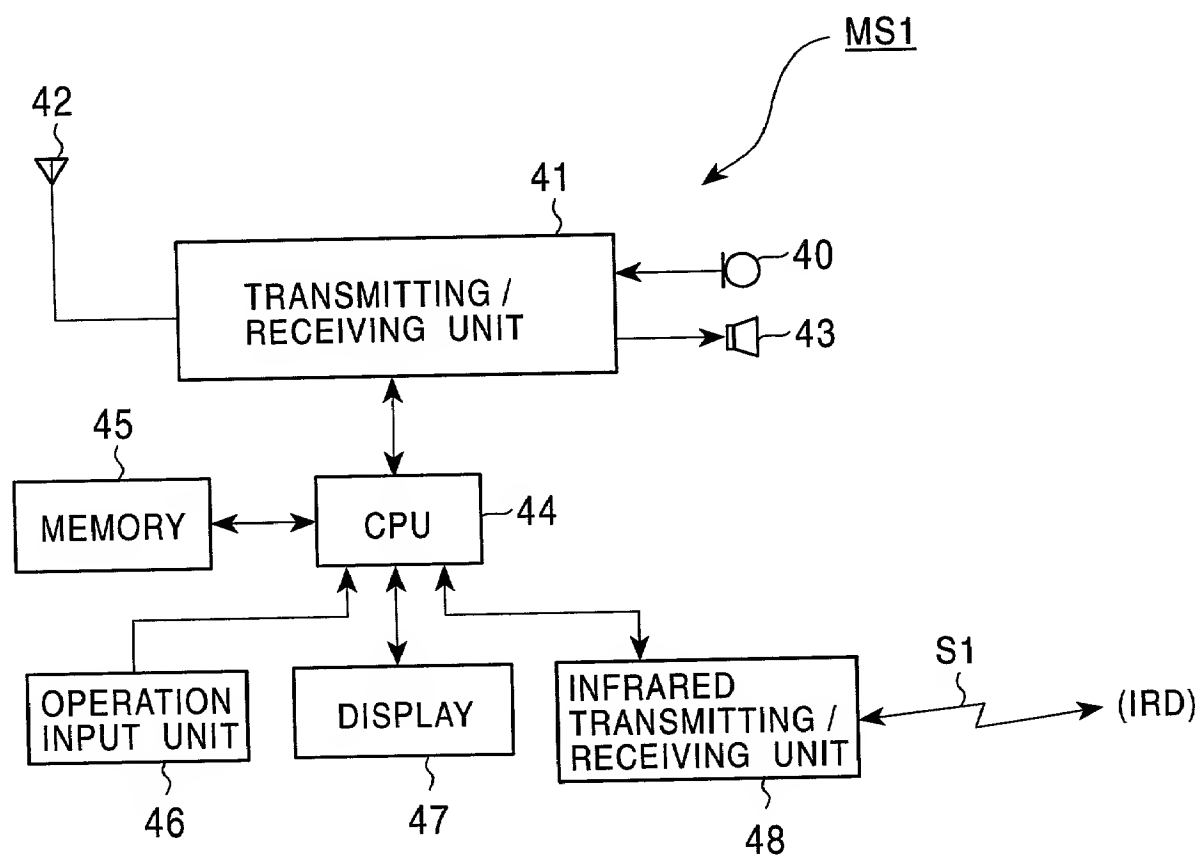


FIG. 5

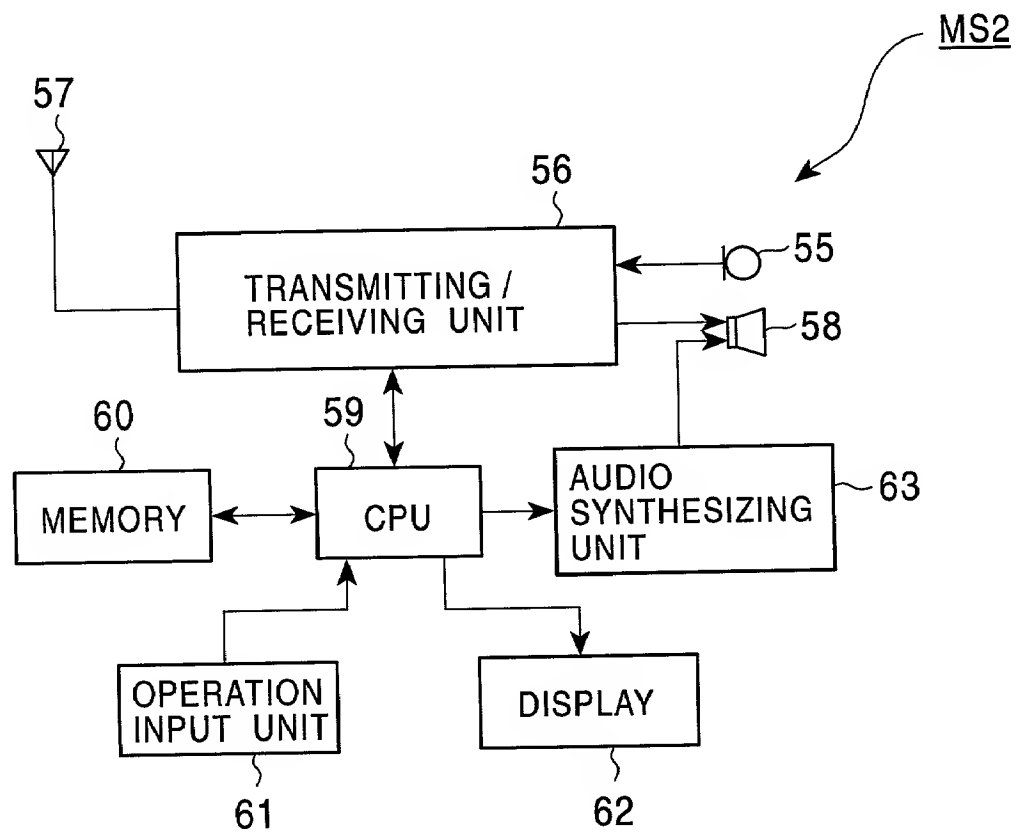


FIG. 6

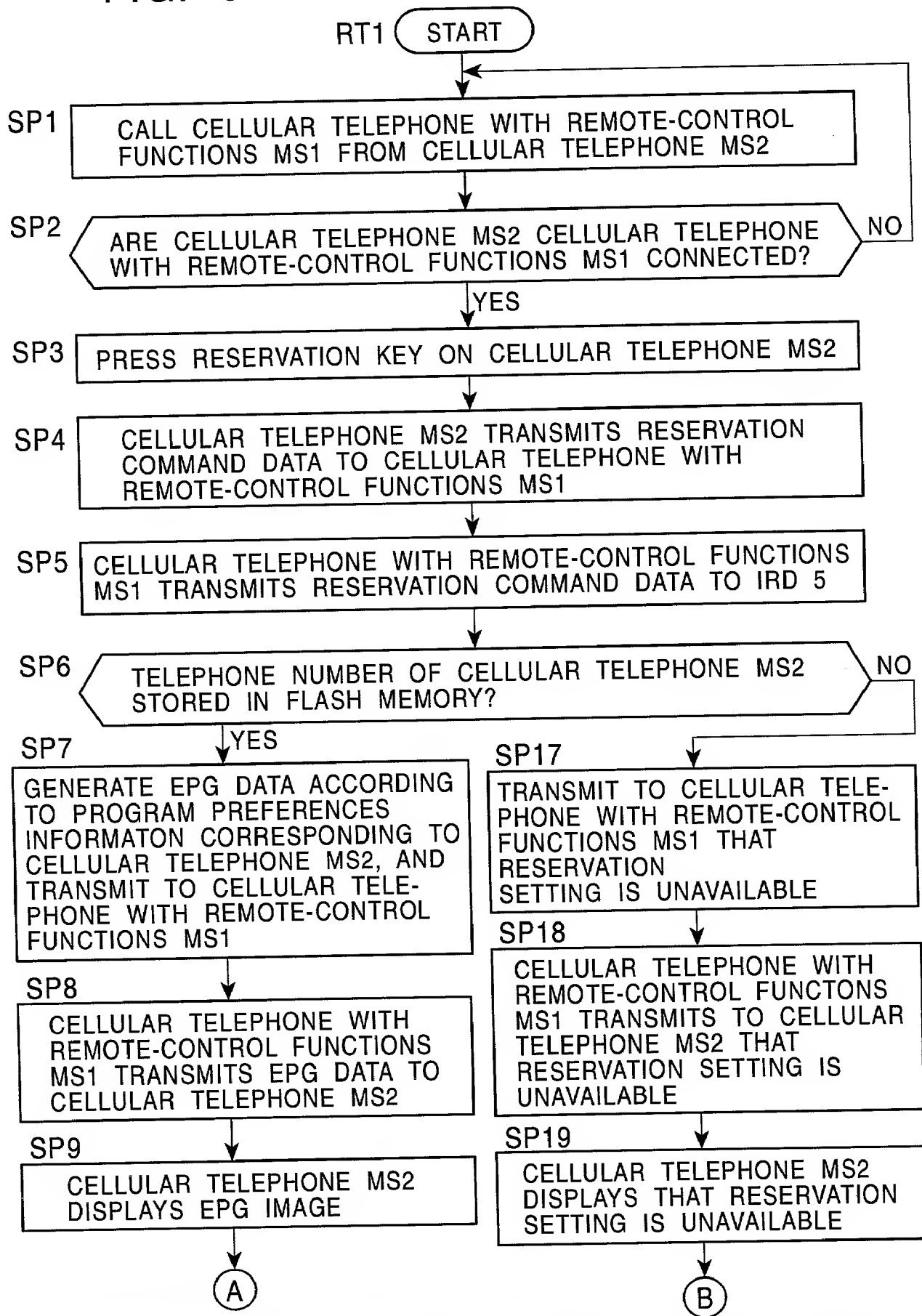


FIG. 7

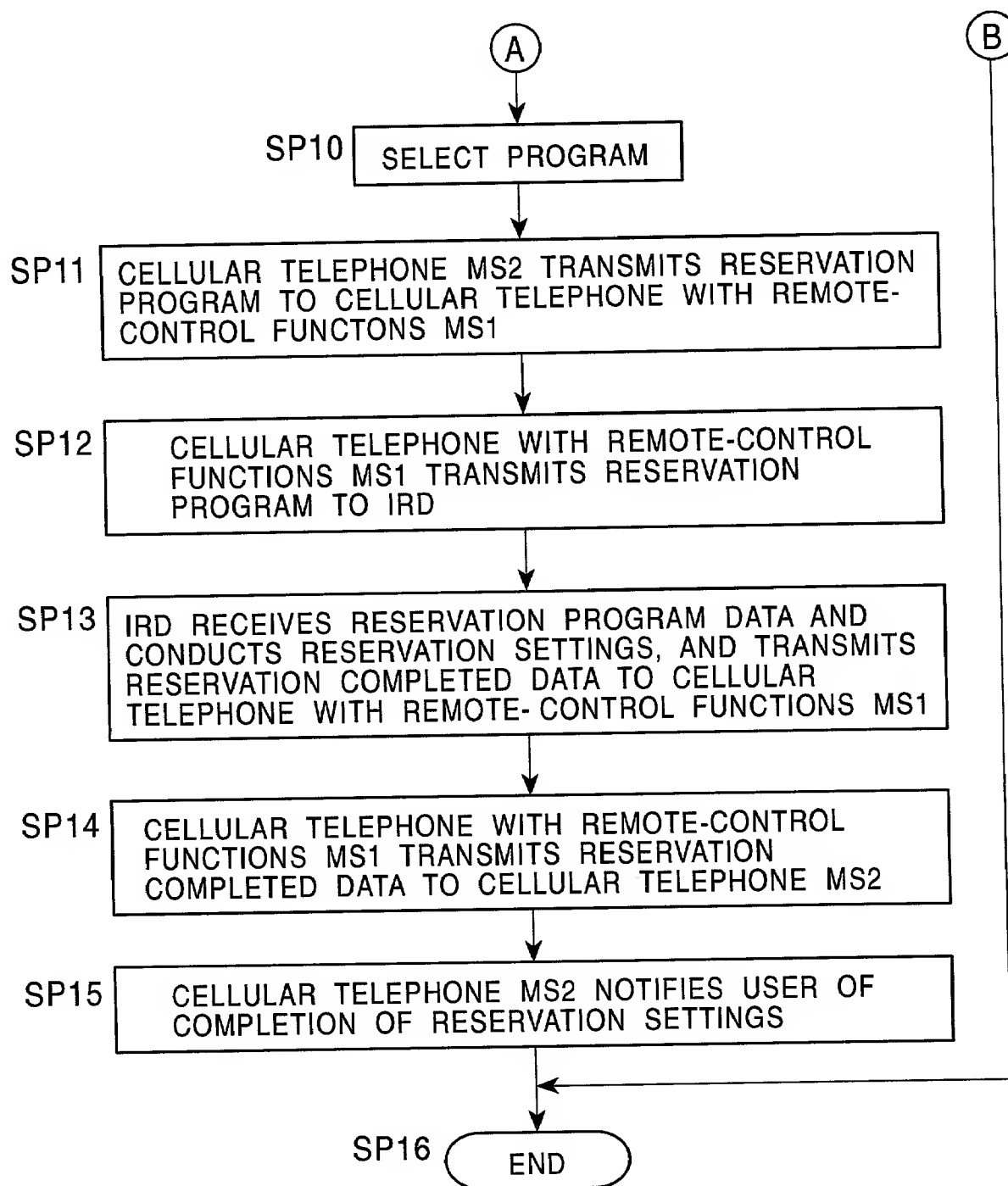


FIG. 8

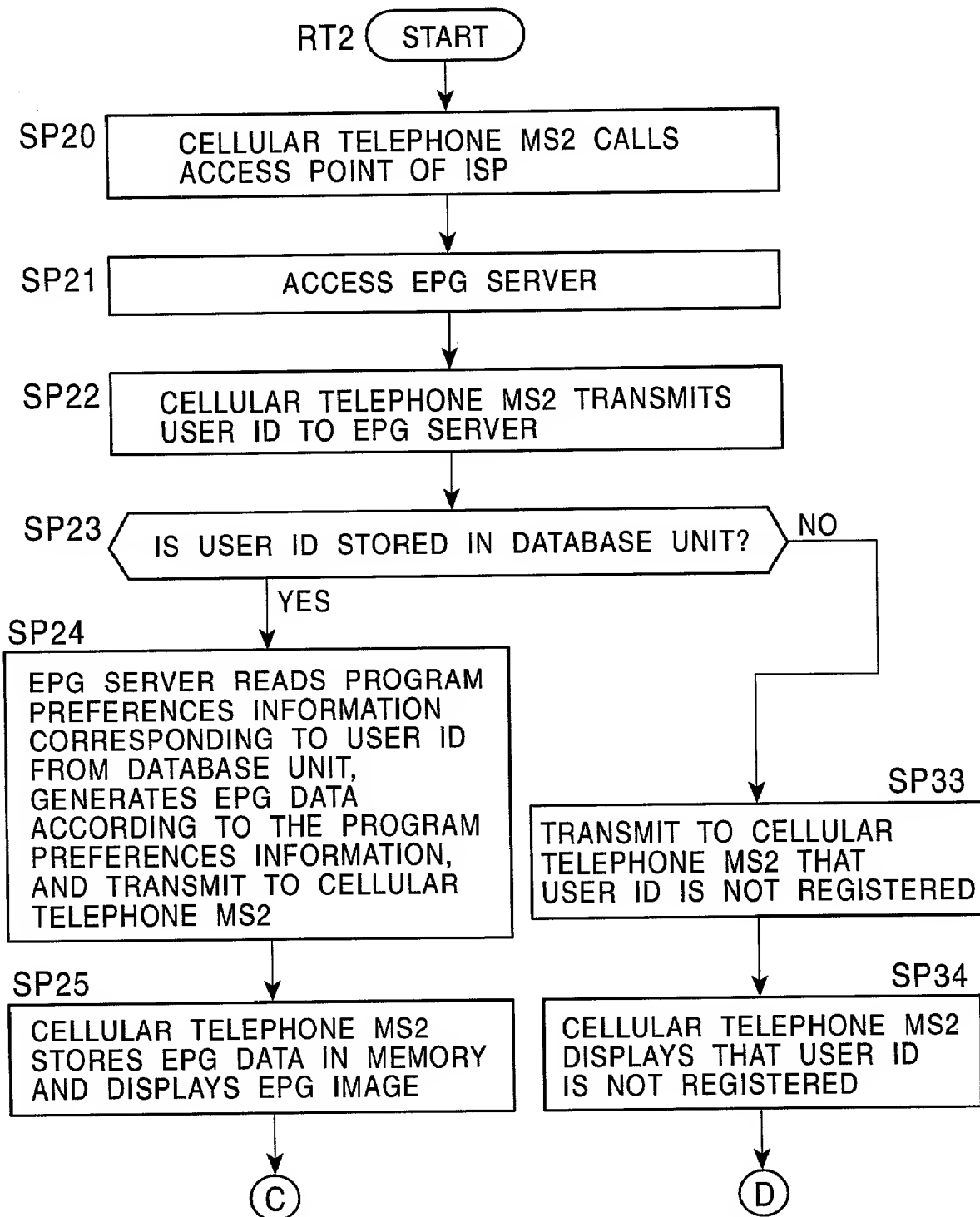
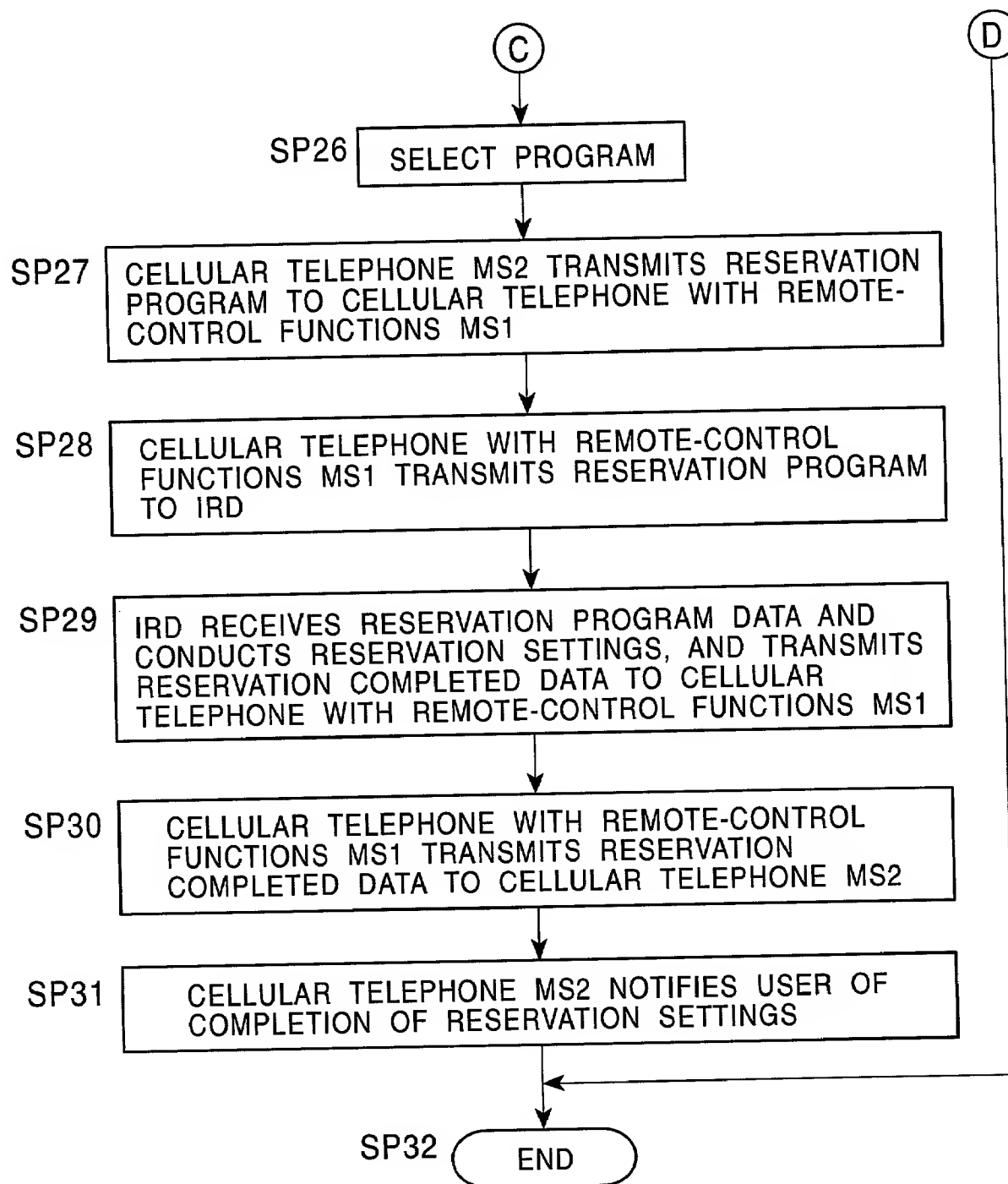


FIG. 9



DECLARATION FOR PATENT APPLICATION (JOINT OR SOLE)
(Under 37 CFR § 1.63; with Power of Attorney)
FROMMER LAWRENCE & HAUG LLP

FLH File No. 450100-02622

As a below named inventor, I hereby declare that:
My residence, post office address and citizenship are as stated below next to my name,
I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first
and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is
sought on the invention ENTITLED:

**PROGRAM GUIDE INFORMATION PROVIDING DEVICE, PROGRAM DEVICE INFORMATION PROVIDING SYSTEM,
INFORMATION RECEIVING DEVICE, REMOTE OPERATING SYSTEM, AND METHOD THEREOF**

the specification of which

X is attached hereto.

_____ was filed on _____ as Application Serial No. _____,

with amendment(s) through _____ (if applicable, give dates).

I hereby state that I have reviewed and understand the contents of the above-identified specification, including
the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose to the United States Patent and Trademark Office all information known to me
to be material to patentability as defined in Title 37, Code of Federal Regulations, Sec. 1.56.

I hereby claim foreign priority benefits under Title 35, United States Code, § 119 of any foreign application(s)
for patent or inventor's certificate listed below and have also identified below any foreign application for patent or
inventor's certificate having a filing date before that of the application on which priority is claimed:

<u>Prior Foreign Application(s)</u>	<u>[List additional applications on separate page]:</u>	<u>Priority Claimed:</u>
<u>Number:</u>	<u>Country:</u>	<u>Yes</u> <u>No</u>
11-217773	Japan	X

I hereby claim the benefit under Title 35, United States Code, § 120 of any United States application(s) listed
below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United
States application in the manner provided by the first paragraph of Title 35, United States Code § 112, I acknowledge the
duty to disclose to the United States Patent and Trademark Office all information known to me to be material to
patentability as defined in Title 37, Code of Federal Regulations, Sec. 1.56, which became available between the filing
date of the prior application and the national or PCT international filing date of this application:

<u>Prior U.S. Application(s)</u>	<u>[List additional applications on separate page]:</u>	<u>Status (patented, pending, abandoned):</u>
<u>Appln. Ser. Number:</u>	<u>Filed (Day/Month/Year):</u>	

I hereby appoint WILLIAM S. FROMMER, Registration No. 25,506, and DENNIS M. SMID, Registration No. 34,930
or their duly appointed associate, my attorneys, with full power of substitution and revocation, to prosecute this
application, to make alterations and amendments therein, to file continuation and divisional applications thereof, to
receive the Patent, and to transact all business in the Patent and Trademark Office and in the Courts in connection
therewith, and specify that all communications about the application are to be directed to the following correspondence
address:

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c/o FROMMER LAWRENCE & HAUG LLP
745 Fifth Avenue
New York, New York 10151

Direct all telephone calls to:
(212) 588-0800
to the attention of:
WILLIAM S. FROMMER

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on
information and belief are believed to be true; and further that these statements were made with the knowledge that
willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of
Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application
or any patent issued thereon.

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Signature: _____		Date: _____
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Signature: _____		Date: _____
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Citizenship:	Japan	

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Note: In order to qualify for reduced fees available to Small Entities, each inventor and any other individual or entity
having rights to the invention must also sign an appropriate separate "Verified Statement (Declaration) Claiming [or
Supporting a Claim by Another for] Small Entity Status" form [e.g. for Independent Inventor, Small Business Concern,
Nonprofit Organization, individual Non-Inventor].

Note: A post office address must be provided for each inventor.

ADDITIONAL INVENTORS

Signature: _____ Date: _____
Full name of 4th joint inventor (if any): Tomoyuki HANAI
Residence: Kanagawa, Japan
Citizenship: Japan

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